

What is claimed is:

1. A high-intensity discharge lamp including an arc tube,
the arc tube comprising:

5 a translucent ceramic discharge chamber that defines a
discharge volume, said chamber having a pair of end sections
provided at both ends of a central section;

a pair of feedthroughs, each of said feedthroughs being
hermetically sealed within one of said end sections respectively;

10 and

a pair of electrodes, each of said electrodes comprising
a tip that extends towards the central section and is connected to
one of said feedthroughs,

15 wherein the discharge chamber is filled with a
discharge medium including a metal halide and a starting gas, said
metal halide comprising at least halides of Na, Tl, and Tm, and

wherein the ratio (M_{Tm}/M) of the mass M_{Tm} of Tm
halide to the total mass M of said metal halide is within a range of
about $0.4 \leq M_{Tm}/M \leq 0.9$.

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2. A high-intensity discharge lamp including an arc tube,
the arc tube comprising:

a discharge chamber having a pair of end sections;

a pair of feedthroughs, each of said feedthroughs

25 being hermetically sealed within one of said end sections of the
discharge chamber, respectively; and

a pair of electrodes, each of said electrodes being connected to one of said feedthroughs,

wherein the discharge chamber is filled with a discharge medium including a metal halide and a starting gas, and

5 wherein said metal halide comprises at least halides of Na, Tl, In, and Tm.

3. A high-intensity discharge lamp according to claim 1, wherein the total mass of the halides of Na, Tl and Tm is greater
10 than 90% by weight of the total mass M of the metal halide.

4. A high-intensity discharge lamp according to claim 2, wherein the total mass of the halides of Na, Tl, In and Tm is greater than 90% of the total mass of the metal halide.

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5. A high-intensity discharge lamp according to claim 2, wherein the ratio (M_{Tm}/M) of the mass M_{Tm} of said Tm halide to the total mass M of said metal halide is within a range of about $0.4 \leq M_{Tm} / M \leq 0.9$.

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6. A high-intensity discharge lamp including an arc tube, the arc tube comprising:

a discharge chamber having a pair of end sections;

a pair of feedthroughs, each of said feedthroughs

25 being hermetically sealed within one of said end sections of the discharge chamber; and

a pair of electrodes, each of said electrodes being connected to one of said feedthroughs,

wherein the discharge chamber is filled with a discharge medium including a metal halide and a starting gas, said metal halide comprising at least halides of Na, Tl, In, and Tm,

wherein the ratio (MT_m/M) of the mass MT_m of said Tm halide to the total mass M of said metal halide is within a range of about $0.4 \leq MT_m / M \leq 0.9$, and

wherein the total mass of the halides of Na, Tl, In, Tm halides is greater than 90% of the total mass M of the metal halide.

7. A high-intensity discharge lamp according to any one of claims 2, 4 and 5, wherein the ratio $(MT_m + MT_l + M_{In})/M$ of the sum of the mass MT_m of the Tm halide and the mass MT_l of the Tl halide and the mass M_{In} of the In halide to the total mass M of the metal halide is within a range of about $0.61 \leq (MT_m + MT_l + M_{In})/M \leq 0.9$, and wherein the ratio (M_{In}/M) of the mass of the In halide to the total mass M of the metal halide is within a range of about $0.01 \leq M_{In}/M \leq 0.1$.

8. A high-intensity discharge lamp according to claim 6, wherein the ratio $(MT_m + MT_l + M_{In})/M$ of the sum of the mass MT_m of the Tm halide and the mass MT_l of the Tl halide and the mass M_{In} of the In halide to the total mass M of the metal halide is within a range of about $0.61 \leq (MT_m + MT_l + M_{In})/M \leq 0.9$,

and wherein the ratio (M_{In}/M) of the mass of the In halide to the total mass M of the metal halide is within a range of about $0.01 \leq M_{In}/M \leq 0.1$.

5 9. A high-intensity discharge lamp according to any one of claims 1, 3, 4 and 6, wherein the metal halide further comprises at least one metal halide selected from the group of metals consisting of Ce, Pr, Ca, Cs, Li, Mg and Rb.

10 10. A high-intensity discharge lamp according to any one of claims 1-6, wherein the deviation in chromaticity (d.u.v.) of the light, emitted during the life of the lamp, on the x-y chromaticity coordinates (CIE 1931) is within the range of about -0.006 to +0.010, wherein the correlated color temperature is within the
15 range of about 3500 to 5000 K, wherein the average color rendition index value (R_a) is within the range of about 75-95, and wherein the luminous efficacy is within the range of about 95-130 lm/W.

 11. A high-intensity discharge lamp according to claim
20 10, wherein the deviation in chromaticity (d.u.v.) of the light, emitted during the life of the lamp, on the x-y chromaticity coordinates (CIE 1931) is within the range of about -0.003 to +0.007

25 12. A high-intensity discharge lamp according to any one of claims 1-6, further comprising an outer jacket, which

hermetically encloses said arc tube, and a pair of feeder members, which are configured to support and position the arc tube relative to said outer jacket, wherein the pair of feeder members is sealed within an end of said outer jacket and is electrically connected to
5 said feedthroughs, and wherein the pressure in the volume defined by the outer jacket at ambient temperature is at most 133 Pa.

13. A high-intensity discharge lamp according to any one of claims 1-6, further comprising an inner shroud disposed within
10 the outer jacket and surrounding the arc tube, said shroud being made of quartz glass whose spectral transmittance in the wavelength range of about 220-370 nm is about 60 % or higher.

14. A lighting device comprising a lamp according to any
15 one of claims 1-6 and a lighting circuit configured to supply a voltage to the lamp, wherein the lamp voltage waveform when the lamp is lit is a rectangular waveform in the range of about 100 Hz - 1 kHz, and wherein the light circuit has a secondary open circuit voltage in the range of about 150 – 400 V.

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15. A lighting device comprising a lamp according to any one of claims 1-6 and a lighting circuit which is configured to light said lamp by a dimming operation.

16. A high intensity discharge lamp according to claim 1, wherein the end sections are tubular sections which have a constant diameter.

5 17. A high intensity discharge lamp according to claim 1, wherein the central section is provided with a given diameter.

18. A high intensity discharge lamp according to claim 17, wherein the internal diameter of the central section is greater
10 than the internal diameter of the end sections.

19. A high intensity discharge lamp according to claim 17, wherein the central section is bulgy or ramp-like with increasing diameter including a most extended diameter.

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20. A high intensity discharge lamp according to any one of claims 1, 2 and 6, wherein the lamp further comprises an outer jacket which hermetically encloses said arc tube.

20 21. A high intensity discharge lamp according to claim 20, further comprising a pair of feeder members configured to support and position the arc tube within the outer jacket, the feeder members being sealed within an end of said outer jacket and electrically connected to said feedthroughs.

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